Smith's "Electroanalysis" will always remain one of the American classics.

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## REPORT OF THE COMMITTEE ON GENERIC TYPES OF THE BOTANICAL SOCIETY OF AMERICA

AT the recent meeting of the Botanical Society of America at Baltimore the appended report was submitted. The proposed regulations for fixing generic types were accepted with the suggestion that they be published and distributed among botanists for their consideration. These regulations, being a part of a proposed Code of Nomenclature, should await the formulation of the latter for final adoption. The second part of the report, dealing with the Permanent Committee on Nomenclature, was adopted and the action recommended was authorized.

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### REPORT OF THE COMMITTEE ON GENERIC TYPES

At its last meeting the society authorized the president to appoint a committee of three upon Generic Types. The members appointed were N. L. Britton, A. S. Hitchcock (chairman) and B. L. Robinson. Dr. Robinson declined to serve and it was found impracticable to obtain a representative from the Gray Herbarium. The remaining members, after some preliminary work, felt that it would be desirable to have the committee enlarged to represent a wider field of American botany. They therefore asked the incoming president, Dr. Trelease, to appoint J. M. Greenman as the third member of the committee and to add two other members, Leroy Abrams and Witmer Stone. The president felt that he did not have authority to enlarge the committee but suggested that the committee ask Messrs. Abrams and Stone to cooperate with it. This was done and these two have served on the committee as if they were members, and the report herewith submitted has received their approval. The committee, as now constituted, represents botanical institutions at Washington, New York, St. Louis, Philadelphia, and on the Pacific Coast.

The members of the committee were first asked to indicate their attitude toward the question of type species. Should the application of generic names be determined by type species; or should a generic name be applied to a generic concept independent of particular species?

The prevailing opinion being in favor of type species, there was sent to the members of the committee, a circular outlining the methods which might be used for selecting type species. Wishing to obtain advice and cooperation from competent botanists throughout the country the circular was sent to about fifty members of the Botanical Society.

It was overwhelmingly established that the botanists were in favor of the two fundamental principles: (1) The application of generic names shall be determined by type species; (2) The type species shall be the species or one of the species included in the genus when originally published (publication of genera of seed plants dating from the issue of Linnæus' "Species Plantarum" in 1753). In addition the opinion was prevailingly in favor of rules approaching those finally agreed upon by the committee.

Circular 5 contained a set of proposed regulations for fixing generic types and a few minor changes were made, resulting in the regulations as included in our report.

The committee makes two recommendations, (1) the adoption of a set of regulations for fixing generic types, and (2) the appointment of a permanent committee on nomenclature.

### REGULATIONS FOR FIXING GENERIC TYPES.

#### INTRODUCTION

Rules of nomenclature should commend themselves as being reasonable and they should be as definite in their application as is consistent with reasonableness. In preparing the regulations the committee consulted other codes of nomenclature, the most important of which are the following:

The International Code of Zoological Nomenclature (see Treas. Dept. Hygien. Lab. Bull. 24 by C. W. Stiles; same with appendix and summaries of opinions 1–67, extracted from Proc. 9th Internat. Zool. Congr. 1913, published by T. O. Smallwood. Opinions 1–67 were published by the Smithsonian Institution). Article 30 concerns generic types.

The Code of Nomenclature adopted by the American Ornithologists' Union. Canons 21–24 concern generic types.

The Entomological Code. Banks and Caudell. Par. 93–106 concern generic types.

International Rules of Botanical Nomenclature. Vienna, 1905. The question of types is not touched upon. The application of generic names is considered in Arts. 45–46.

The American Code of Botanical Nomenclature (see *Bull. Torrey Club,* 34: 167, 1907). Canon 15 concerns generic types.

Recognizing the impossibility of framing a set of rules which shall cover all cases, since all contingencies can not be foreseen, the regulations have been divided into rules and recommendations. Under the rules are included statements of general principles to which all generic nomenclature should conform when considered from the standpoint of the type concept. It is thought that the types indicated by these rules will be acceptable without question to the great majority of botanists.

In order to adapt the genera of the older botanists to the modern concept to types it is necessary for us now to select type species for those genera for which no type would be indicated under our present rules. Some codes attempt by means of detailed rules automatically to select type species, hoping thus to secure uniformity, definiteness and stability. As all difficulties in the application can not be foreseen, the results in some cases have been confusing and have tended to cast disrepute upon the rules. This committee has appreciated the desirability of framing a code which shall possess definiteness but has endeavored to secure this by giving to a committee judicial functions.

The second part of the regulations consists of a series of recommendations. These are fairly elastic and can be applied reasonably rather than arbitrarily. In a large majority of cases the results obtained would be unquestioned. There would be, however, a small number of cases, especially among Linnæan genera, in which competent botanists might arrive at different results. It is proposed that such cases should be referred to a permanent committee which shall investigate them and recommend decisions to this society. It is believed that by this method types of genera may be selected which will receive the approval of the great majority of botanists. We look forward to an international agreement upon the types of all genera, thus laying the foundation for stability in nomenclature.

The proposed regulations follow:

## I. RULES

Article 1. The application of generic names shall be determined by type species.

Article 2. The type species shall be the species or one of the species included in the genus when originally published (publication of the genera of seed plants dating from the issue of Linnæus's "Species Pantarum" in 1753).

(*a*) If a genus includes but one species when originally published, this species is the type.

Article 3. When, in the original publication of a genus, one of the species is definitely designated as type, this species shall be accepted as the type, regardless of other considerations.

(*a*) If *typicus* or *typus* is used as a new specific name for one of the species, this species shall be accepted as the type as if it were definitely designated.

Article 4. The publication of a new generic name as an avowed substitute for an earlier one does not change the type of the genus.

Article 5. If a genus, without an originally designated type, contains among its original species one with the generic name used as a specific name, either as a valid name or synonym, that species is to be accepted as the type.

*Example.*—The type species of Pentstemon

(Ait. Hort. Kew. 2: 360. 1789) is *Chelone Pentstemon* (L. Sp. Pl. 612. 1753; ed. 2. 850. 1763) because the later is cited as a synonym under one of the species of *Pentstemon*.

Article 6. If a genus, when originally published, includes more than one species, and no species is definitely designated as type, nor indicated according to Article 5, the choice of the type should accord with the following principles:

(*a*) Species inquirendae or species doubtfully referred to the genus, or mentioned as in any way exceptional are to be excluded from consideration in selecting the type.

(*b*) Genera of the first edition of Linnæus's "Species Plantarum" (1753) are usually typified through the citations given in the fifth edition of his "Genera Plantarum" (1754) except when inconsistent with the preceding articles.

*Example.—Arundo* (L. Sp. Pl. 81. 1753) is typified by *A. Donax* since this is the species figured by Scheuchzer in the plate cited by Linnæus (Gen. Pl. 35. 1754).

(*c*) Species which definitely disagree with the generic description (provided others agree), or which possess characters stated in the generic description as rare or unusual, are to be excluded from consideration in selecting the type.

II. RECOMMENDATIONS

Article 7. In the future it is recommended that authors of generic names definitely designate the type species; and that in the selection of types of genera previously published, but of which the type would not be indicated by the preceding articles, the following points be taken into consideration:

(*a*) The type species should usually be the species or one of the species which the author had chiefly in mind. This is often indicated by

1. A closer agreement with the generic description.

2. Certain species being figured (in the same work).

3. The specific name, such as *vulgaris, communis, medicinalis* or *officinalis*.

(*b*) The type species should usually be the one best known to the author. It may be assumed that an indigenous species (from the standpoint of the author), or an economic species, or one grown in a botanical garden and examined by the author, would usually represent an author's idea of a genus.

(*c*) In Linnæan genera the type should usually be chosen from those species included in the first technical use of the genus in pre-Linnæan literature.

*Example.*—The type species of *Andropogon* L. should be chosen from the two species included by Linnæus in the first use of the name (L. Fl. Leyd. 1740).

(*d*) The types of genera adopted through citations of non-binomial literature (with or without change of name) should usually be selected from those of the original species which received names in the first binomial publication.

*Example.—Cypripedium* (L. Sp. Pl. 951) is typified by *C. Calceolus*. Under *Cypripedium* (Gen. Pl. 408. 1754) Linnæus cites *Calceolus* Tourn. 249. Tournefort mentions 5 species, one of which is cited under *Cypripedium Calceolus* by Linnæus.

(*e*) The preceding conditions having been met, preference should be shown for a species which will retain the generic name in its most widely used sense, or for one which belongs to a division of the genus containing a larger number of species, or, especially in Linnæan genera, for the historically oldest species.

*Example.—Phalaris* L. is typified by *P. canariensis* because it is the only one of the 5 Linnæan species known to the older writers (such as Bauhin) by the name of *Phalaris*, so far as shown by the synonyms given by Linnæus.

(*f*) Among species equally eligible, the preference should be given to the first known to have been designated as the type.

(*g*) If it is impossible to select a type under the conditions mentioned above the first of equally eligible species should be chosen.

PERMANENT COMMITTEE ON NOMENCLATURE

1. It is recommended that the present committee be enlarged to 9 members and be made a standing committee on Botanical Nomencla-

ture, the two members who have acted in cooperation with the committee to be formally added to that body; and that the president of the Botanical Society appoint additional members, one with a special knowledge of the Bryophyta or Pteridophyta, one with a special knowledge of the Algæ, and two with a special knowledge of fungi.

2. This committee shall investigate doubtful or questioned cases, either upon its own initiative or in response to requests, and shall recommend decisions. It may prepare a code of Botanical Nomenclature and may, at regular meetings of the society, recommend changes or additions to the code. It is suggested that the committee undertake, as soon as practicable, the typifying of the Linnæan genera, as this must be the basis of all future work.

## SPECIAL ARTICLES

### TEMPERATURE AND VERTEBRÆ IN FISHES; A SUGGESTED TEST

In 1862, Dr. Günther[1] noted that in the family of Labridæ (Wrasse fishes) the tropical species had 24 (10 + 14) vertebræ while those of temperate seas had a larger number, the increase being mainly in the caudal region.

In 1863, Dr. Gill showed that this generalization could be extended to other families, and that it was to "be considered in connection with the predominance in northern waters" of soft-rayed fishes" in which the increase in the number of vertebræ is a normal feature." This generalization thus included the herring, trout, salmon, smelt, cod, flounder and their relatives, and might have been extended to the sculpins, greenlings and other spiny-rayed fishes—northern types as well.

In 1864, Dr. Gill noted that the northern genus, *Sebastes,* with 12 + 19 = 31 vertebræ showed a similar relation to its tropical relative *Scorpæna,* with 10 +1 4 = 24.

In various papers, the present writer has extended this generalization to numerous other families, raising it to the dignity of a "law." In general, among, spiny-rayed fishes, the tropical forms have the vertebræ 10 + 14, the northern forms, fresh-water forms, pelagic species and deep-sea representatives a larger number. In the groups of soft-rayed fishes, the vertebræ in the tropics usually range higher than 24 (35 to 43) among flounders while the subarctic species all run higher (among flounders 49 to 65). The sub-Arctic blennies have the vertebræ 75 to 100, their tropical relatives 28 to 49. Some such relation exists in every group—eel-shaped fishes excepted. These have no northern representatives and in them the whole body is peculiarly modified in accordance with their mode of life.

The facts being fairly established we look next to its explanation. Dr. Gill states (1889) that "it is simply the expression of a fact which has no cause for its being now known." He further doubts whether it can ever be ascertained.

In my own first paper on the subject[2] I suggested that the larger numbers might be primitive, and that the smaller numbers (accompanied by corresponding increase in complexity of the individual vertebræ) were the result of specialization or "ichthyization," a process which in the favoring temperature, amid intense competition of the tropics and especially about coral-reefs, brought about the more perfect or fish-like fish.

I am now, however, inclined to accept Dr. Boulenger's suggestion that the increased numbers and the lack of specialization of parts is the result of a form of degeneration, and that the lower number is a primitive trait possessed by the ancestors of most of the higher bony-fishes.

One way of testing this has occurred to me. The genus *Sebastodes* and its near allies ("rock-cod") form a large part of the temperate fish-fauna of California and Japan. These stand intermediate in characters as well as in geography between the subarctic rose-fishes (*Sebastes, Sebastolobus,* etc.) and the tropical scorpion-fishes (*Scorpæna, Helicolenus,* etc.) with their derivatives and allies.

In *Sebastes,* the vertebræ are 12 + 19 = 31; in *Sebastodes,* 12 + 15 = 27, and in *Scorpæna,* 10 + 14 = 24. The species of *Sebastes* and

[1] "Catalogue of the Fishes of the British Museum," Vol. IV.

[2] *Proc. U. S. Nat. Mus.,* XIV., 1891.